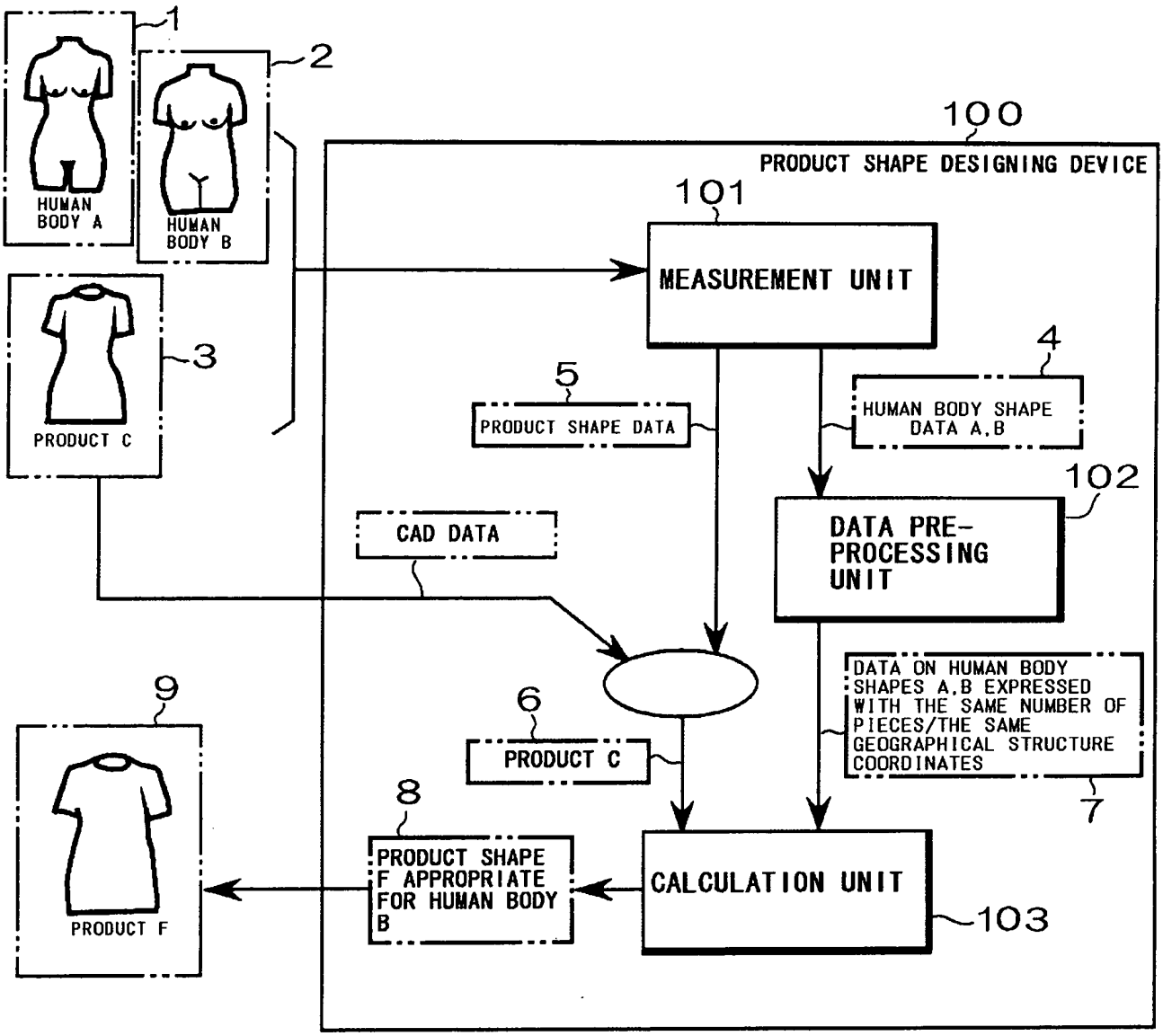
1
HUMAN BODY A
2
HUMAN BODY B
3
PRODUCT C
100
PRODUCT SHAPE DESIGNING DEVICE
101
MEASUREMENT UNIT
4
HUMAN BODY SHAPE DATA A,B
5
PRODUCT SHAPE DATA
102
DATA PRE-PROCESSING UNIT
CAD DATA
DATA ON HUMAN BODY SHAPES A,B EXPRESSED WITH THE SAME NUMBER OF PIECES/THE SAME GEOGRAPHICAL STRUCTURE COORDINATES
7
6
PRODUCT C
8
PRODUCT SHAPE F APPROPRIATE FOR HUMAN BODY B
CALCULATION UNIT
103
9
PRODUCT F

FIG. 1

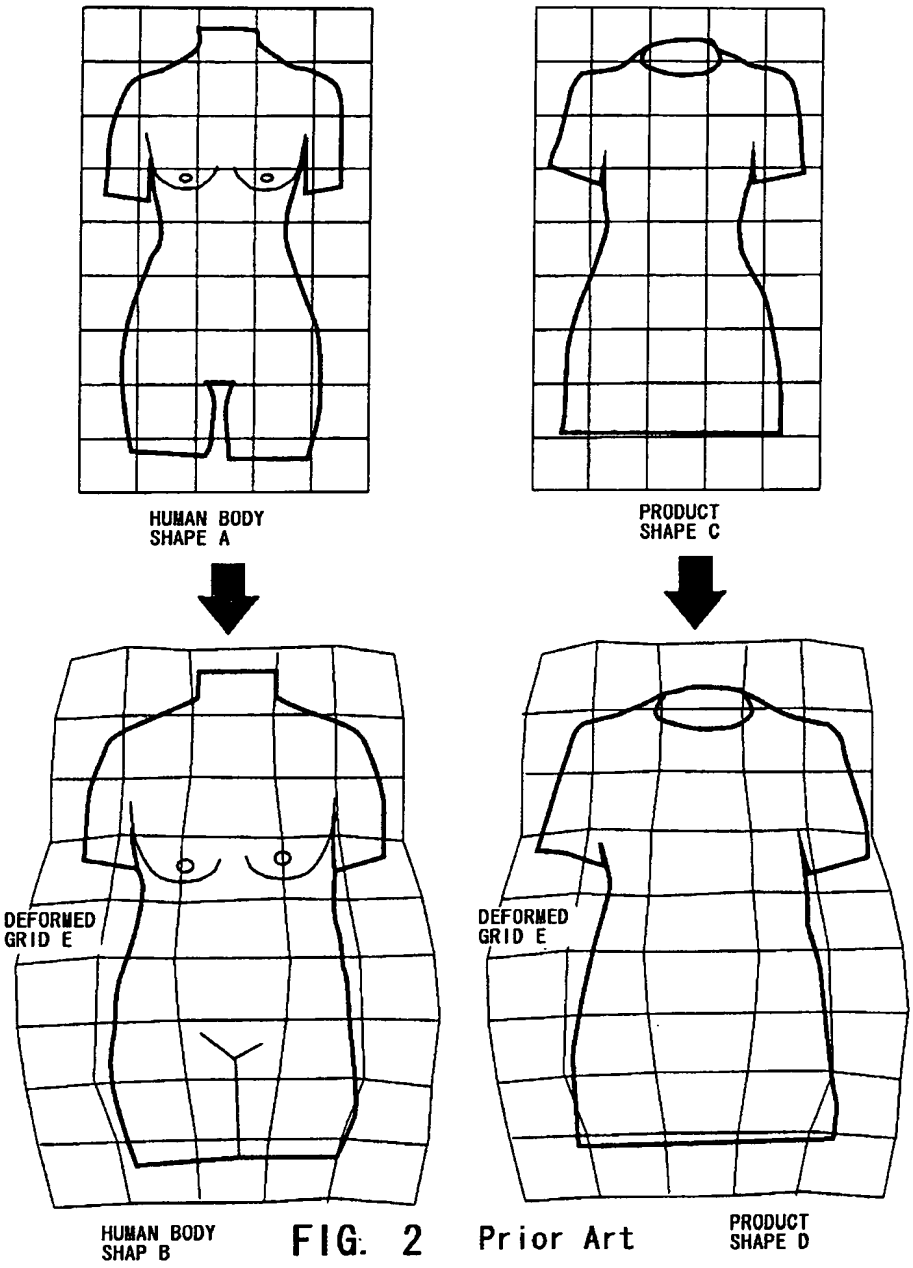

FIG. 2 Prior Art

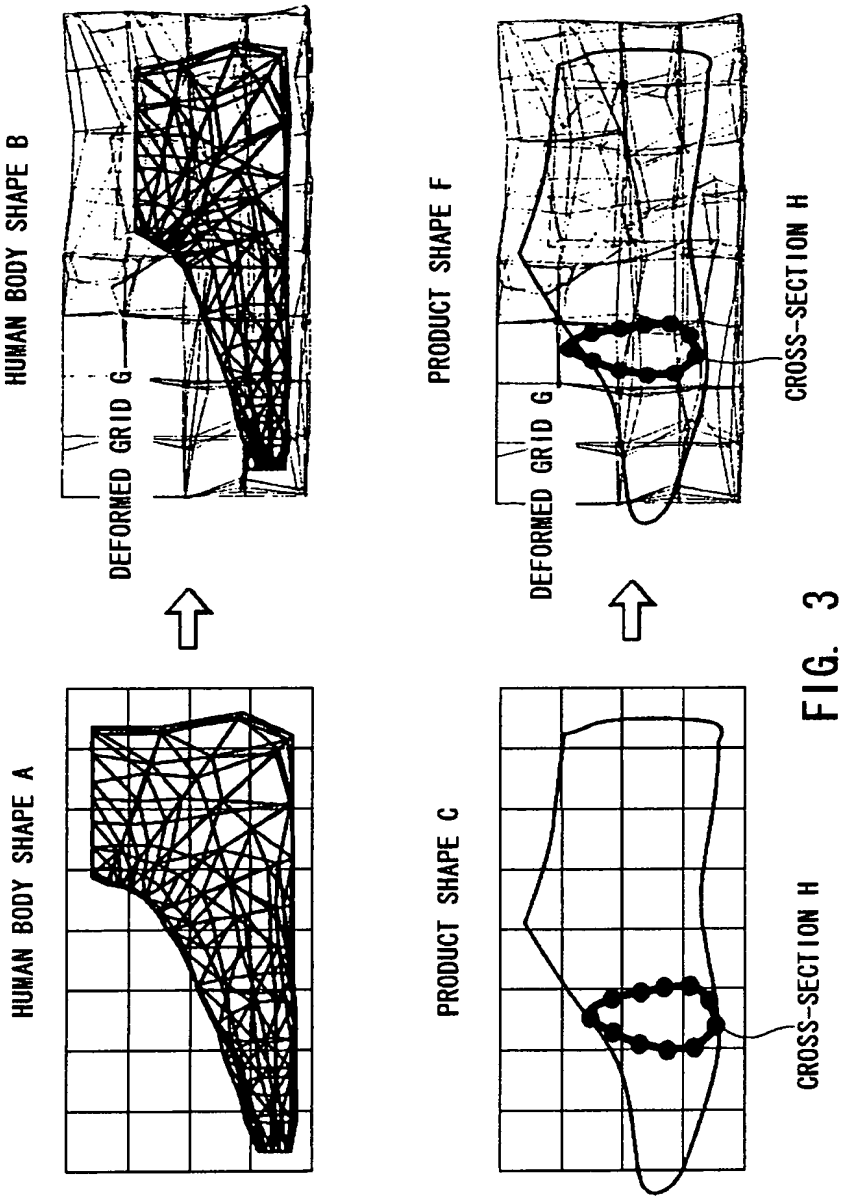
HUMAN BODY SHAPE A
HUMAN BODY SHAPE B
DEFORMED GRID G
PRODUCT SHAPE C
PRODUCT SHAPE F
DEFORMED GRID G
CROSS-SECTION H
CROSS-SECTION H

FIG. 3

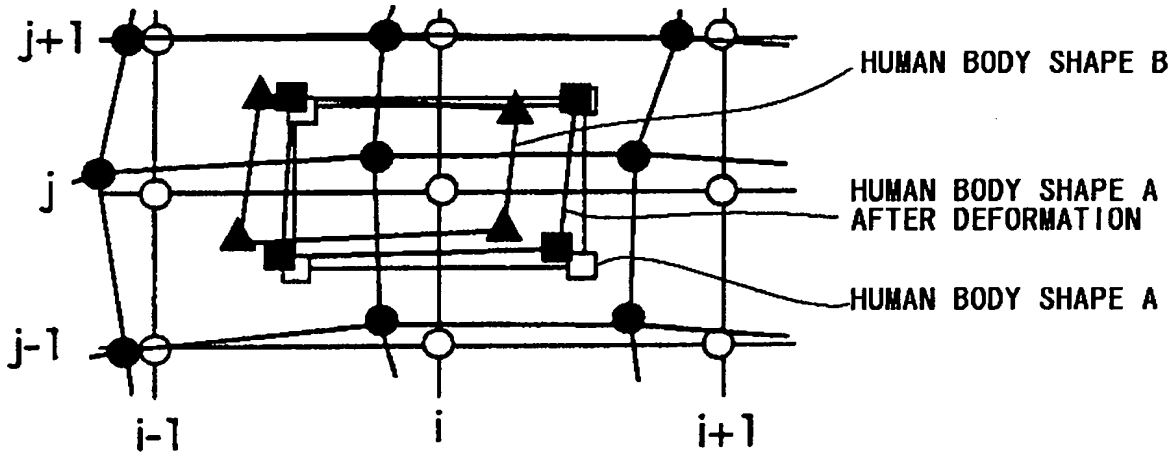
j+1
j
j-1
i-1
i
i+1
HUMAN BODY SHAPE B
HUMAN BODY SHAPE A
AFTER DEFORMATION
HUMAN BODY SHAPE A

FIG. 4

$$\text{ERROR FUNCTION} = \sum^{\text{vertex}} \left(\blacksquare - \blacktriangle \right)^2_{\text{Data Force}}$$

$$+ \alpha \sum^{\text{grid}} \left\{ \left(\bullet_{i-1,j,k} - \bullet_{i,j,k} \right) - \left(\circ_{i-1,j,k} - \circ_{i,j,k} \right) \right\}^2_{\text{internal Force}}$$

$$+ \beta \sum^{\text{grid}} \left\{ \left(\bullet_{i-1,j,k} - \circ_{i-1,j,k} \right) - \left(\bullet_{i,j,k} - \circ_{i,j,k} \right) \right\}^2_{\text{internal Force}}$$

$$+ \gamma \sum^{\text{Cross Section Num}} \left(0 - L \right)^2_{\text{Data Force}}$$

FIG. 5

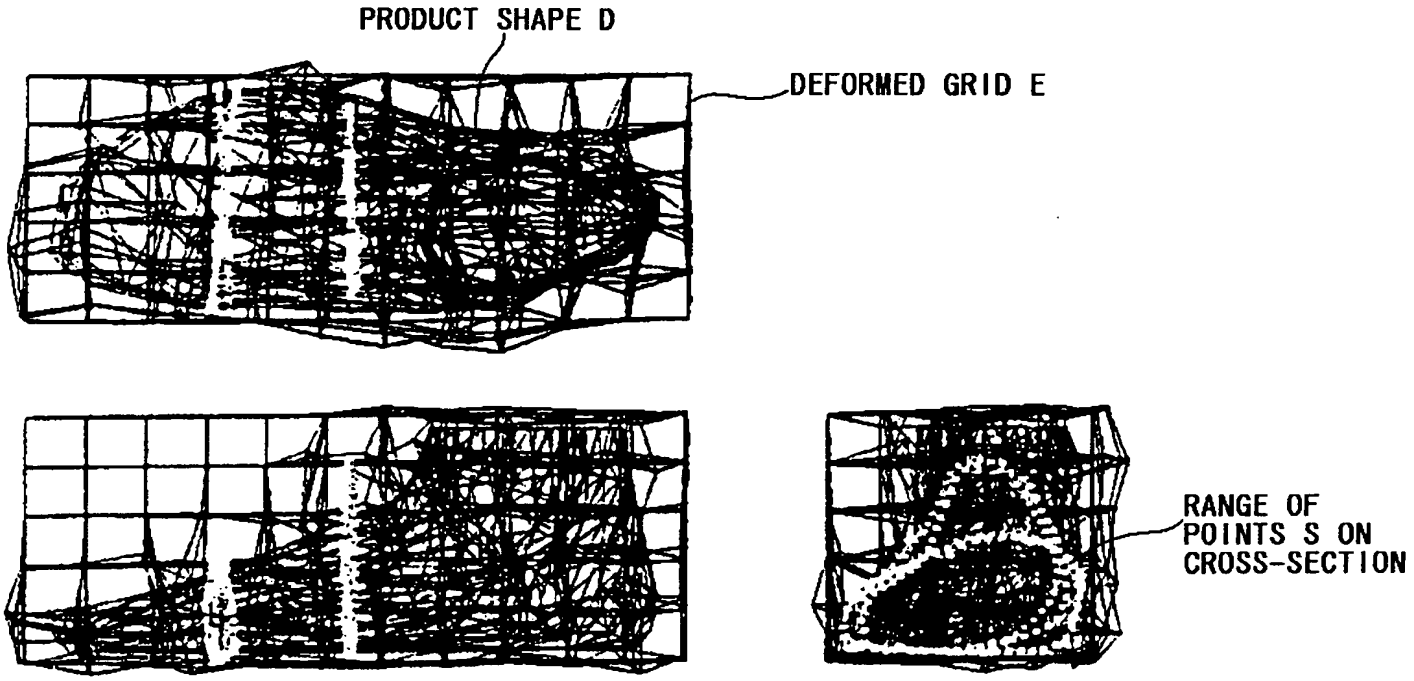
PRODUCT SHAPE D
DEFORMED GRID E
RANGE OF POINTS S ON CROSS-SECTION

FIG. 6

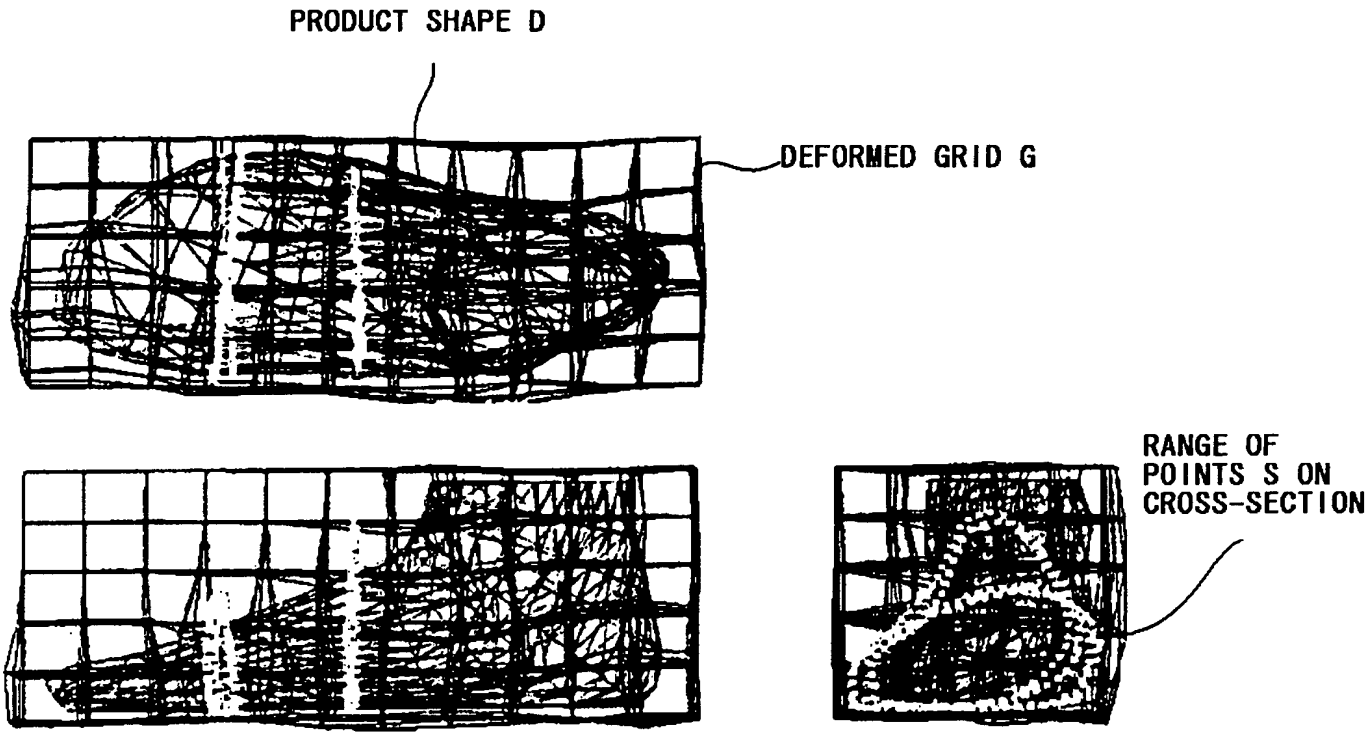
PRODUCT SHAPE D
DEFORMED GRID G
RANGE OF POINTS S ON CROSS-SECTION

FIG. 7

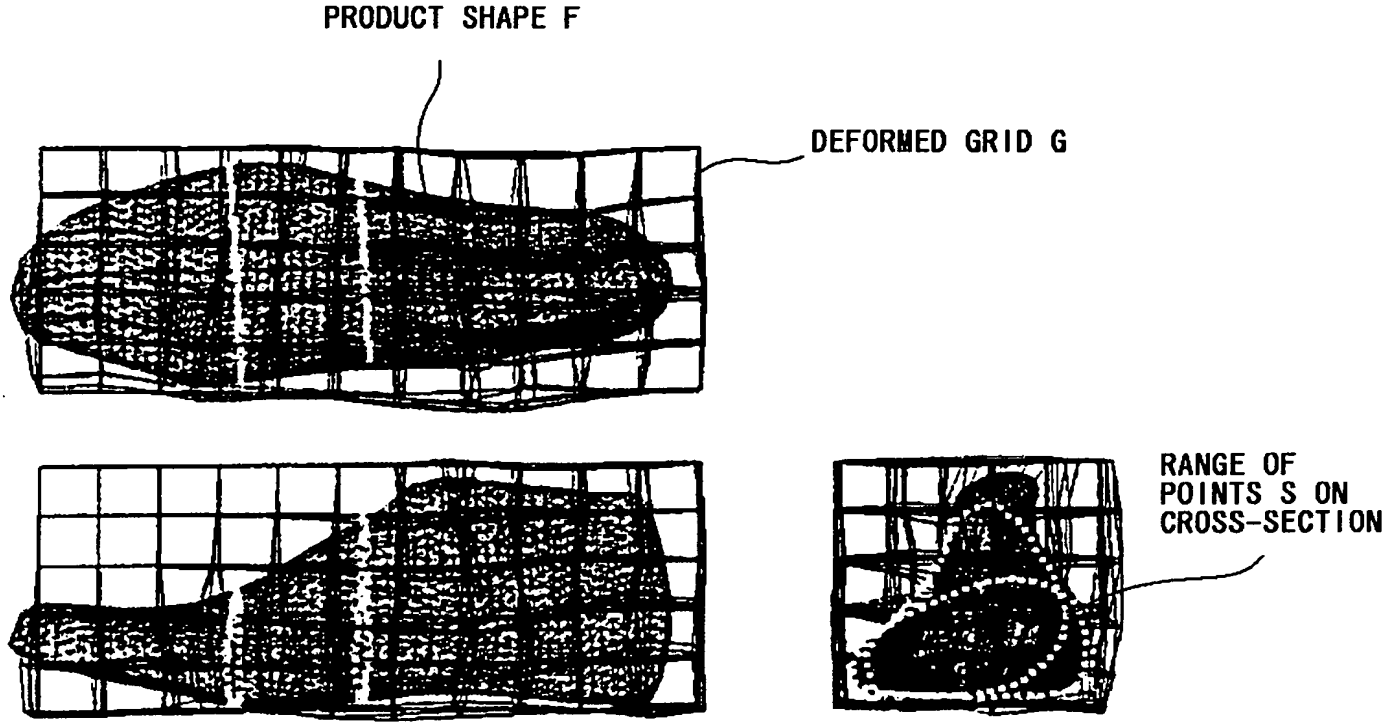
PRODUCT SHAPE F
DEFORMED GRID G
RANGE OF POINTS S ON CROSS-SECTION

FIG. 8